

IN THE CLAIMS:

Please amend claims 1, 3, 5, 7-12, 17, 19, 20, 24 and 26-28 as follows.

1. (Currently Amended) An image processing device comprising:

an image pick-up device ~~having a fixed positional relationship with respect to~~  
mounted on a measurement object;

an orientation sensor adapted to measure the an orientation at an image pick-up  
~~visual point~~ of said image pick-up device;

a storage unit ~~adapted to store that stores~~ calculation information to calculate the an  
orientation of said measurement object or the a position and orientation of said  
measurement object on the basis of a measured value ~~an~~ output from said orientation  
sensor;

a prediction position calculation unit ~~adapted to calculate that calculates~~ a  
prediction position of an index in an image picked-up by said image pick-up device on the  
basis of the measured value orientation;

~~an extracting a target image setting unit adapted to extract that sets~~ an image area of  
the index from the picked-up image on the basis of the prediction position of the index, and  
extracts an image in the set area;

a rotating unit that rotates ~~rotate~~ the extracted image area using a roll rotation angle  
in a roll direction, according to the measured orientation value, of said image pick-up  
device, and ~~outputs~~ the rotated image area as a target image;

a detecting unit ~~adapted to detect the that detects~~ a position of said the index in said  
the target image by performing a template matching process between a template image of  
said the index and said the target image;

an updating unit ~~adapted to update said that updates the~~ calculation information stored in said storage unit on the basis of ~~[[a]] the~~ detected position of ~~said the~~ index detected by said detecting unit; and

a calculation unit ~~adapted to calculate that calculates the orientation and/or of said measurement object or the position and orientation~~ of said measurement object on the basis of ~~[[a]] the~~ measured value from said orientation sensor and ~~said the~~ calculation information updated by said updating unit.

2. (Cancelled)

3. (Currently Amended): The image processing device according to claim 1, wherein ~~said the~~ calculation information is the correction information to correct for an error in the measured value ~~of the orientation~~ measured by said orientation sensor, and said calculation unit calculates the orientation of said measurement object on the basis of ~~said the~~ measured value and ~~said the~~ correction information.

4. (Cancelled)

5. (Currently Amended) The image processing device according to claim 1, wherein ~~said the~~ calculation information is the correction information to correct for an error in the measured value ~~of the orientation~~ measured by said orientation sensor and ~~the~~ position information of ~~the image pick-up visual point of~~ said image pickup device, and said calculation unit calculates the position and orientation of said measurement object on

the basis of said the measured value, said the correction information and said the position information.

6. (Cancelled)

7. (Currently Amended) The image processing device according to claim 5, wherein said updating unit updates the position information in the two directions except for a depth direction in the camera coordinate system of said image pickup device, even when said detecting unit detects an index of only a single point ~~is detected in said detecting unit~~.

8. (Currently Amended) The image processing device according to claim 3, wherein ~~said the~~ correction information is the information to correct for an error in the azimuth direction among the measured values ~~of the attitude~~ measured by said ~~attitude orientation~~ sensor.

9. (Currently Amended) The image processing device according to claim 1, wherein said updating unit updates said the calculation information on the basis of the detected position of said the index in said the picked-up image.

10. (Currently Amended) The image processing device according to claim 3, wherein said updating unit updates said the calculation information on the basis of a typical value of the updated value of said the calculation information obtained for each index when said detecting unit detects a plurality of indices ~~are detected in said detecting unit~~.

11. (Currently Amended) The image processing device according to claim 3, wherein said updating unit updates ~~said the~~ calculation information on the basis of a dislocation between the prediction position and ~~said the~~ detected position of ~~said the~~ index in ~~said the~~ target image.

12. (Currently Amended) The image processing device according to claim 11, wherein said updating unit updates ~~said the~~ calculation information on the basis of a typical value of ~~said the~~ dislocation obtained for each index when said detecting unit detects a plurality of indices ~~are detected in said detecting unit~~.

13 - 16 (Cancelled)

17. (Currently Amended) The image processing device according to claim 1, wherein said measurement object is an image pick-up visual point of said image pick-up device and said image processing device further comprises a display unit ~~adapted to display~~ said pick-up that displays the pick-up image with ~~the a~~ image in ~~the a~~ virtual space superposed thereon on the basis of the orientation of said image pick-up device or the position and orientation of said image pick-up device calculated by said calculation unit.

18. (Cancelled)

19. (Currently Amended) The image processing device according to claim 1, wherein said measurement object is a visual point of ~~the an~~ observer, and said image processing device further comprises a display unit ~~adapted to display the~~ that displays an

image in ~~the~~ a virtual space drawn on the basis of the orientation or ~~the~~ position and orientation of the observer calculated by said calculation unit on a display screen, while ~~the observer is observing~~ optically transmitting the image in the real space through said display screen ~~observed by the observer~~.

20. (Currently Amended) An image processing device in which ~~the~~ a position of an index in a picked-up image picked up by an image pick-up device is detected by a template matching process employing a template image of said ~~the~~ index, comprising:

an orientation sensor that measures an ~~for measuring the orientation at an image pick-up visual point~~ of said image pick-up device;

a prediction position calculation unit ~~adapted to calculate~~ that calculates a prediction position of the index in an image picked-up by ~~the~~ said image pick-up device on the basis of the measured orientation;

~~an extracting a target image creating unit adapted to extract~~ that sets an image area of ~~the index from~~ the picked-up image on the basis of the prediction position of the index, and extracts an image in the set area;

a rotating unit that rotates ~~rotate~~ the extracted image area using a ~~roll~~ rotation angle in a roll angle, according to the measured orientation, of said image pick-up device, and outputs the rotated image area as a target image; and

a detecting unit ~~adapted to detect~~ that detects the position of said ~~the~~ index in said ~~the~~ picked-up image by performing [[a]] the template matching process between said ~~the~~ template image and said ~~the~~ target image.

24. (Currently Amended) ~~An~~ A computer-implemented image processing method comprising:

an image pick-up step, of picking up an image with an image pick-up device having ~~a fixed positional relationship with respect to~~ mounted on a measurement object;

an orientation measuring step, of measuring ~~the~~ an orientation at ~~an image pick-up~~ visual point of the image pick-up device;

a storage step, of storing calculation information to calculate ~~the~~ an orientation of the measurement object or ~~the~~ a position and orientation of the measurement object on the basis of the measured value measured in said orientation measuring step;

a prediction position calculation step of calculating a prediction position of an index in an image picked-up by said image pick-up step on the basis of the measured orientation value measured in said orientation measuring step;

a target image setting step, of ~~extracting an image area of the index from~~ setting an area of the picked-up image on the basis of the prediction position of the index, extracting an image in the set area rotating the extracted image ~~area~~ using a roll rotation angle in a roll direction, according to the measured orientation value, of the image pick-up device, and outputting the rotated image ~~area~~ as a target image;

a detecting step, of detecting ~~the~~ a position of the index in the target image by performing a template matching process between a template image of the index and the target image;

an updating step, of updating the calculation information stored in said storage step, on the basis of a detected position of the index detected in said detecting step; and

a calculating step, of calculating the orientation ~~and/or of the measurement object~~  
or the position and orientation of the measurement object on the basis of a the measured  
value from said orientation measuring step and the calculation information updated in said  
updating step.

25. (Cancelled)

26. (Currently Amended) A computer program embodied in a computer-readable  
medium and comprising computer-executable code for executing the computer-  
implemented image processing method according to claim 24.

27. (Currently Amended) A computer-readable storage medium storing the  
computer-executable program code according to claim 26.

28. (Currently Amended) ~~An~~ A computer-implemented image processing method  
for use with an image processing device in which ~~the~~ a position of an index in a picked-up  
image picked up by an image pick-up device is detected by a template matching process  
employing a template image of said index, said method comprising:

an orientation measuring step of measuring the orientation ~~at an image pick-up  
visual point~~ of the image pick-up device;

a prediction position calculating step of calculating a prediction position of the  
index in the image picked-up by the image pick-up device on the basis of the measured  
orientation measured in said orientation measuring step;

a target image creating step of ~~extracting an image area of the index from~~ setting an area of the picked-up image on the basis of the prediction position of the index, extracting an image in the set area rotating the extracted image ~~area~~ using a ~~roll~~ rotation angle in a roll direction, according to the measured orientation, of the image pick-up device, and outputting the rotated image ~~area~~ as a target image; and

a detecting step of detecting the position of the index in the picked-up image by performing ~~[[a]]~~ the template matching process between the template image and the target image.